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The impact of socio-economic background on satisfaction: evidence for policy-makers

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Abstract Consumer satisfaction with utility services has received increased attention from firms, consumer associations, regulators and governments since the 1990s. Evidence is mounting that consumers in specific socio-economic groups express lower satisfaction levels than their peers, at least, in some utility markets. Seeing this as part of their remit to protect consumer welfare, governments and international organizations are exploring possible demand-side policy responses with the intention of ameliorating lower satisfaction levels of these groups of consumers. However, more information on the precise relationships between satisfaction and consumers' socio-economic background is required if policy is to be proportional and effective. This paper provides new empirical knowledge on this topic by contrasting consumers' stated and revealed preferences for five utility services (electricity, gas, fixed and cellular telephony and Internet) across twelve European countries. We find strong evidence that consumers' socio-economic characteristics matter: consumers with lower levels of education, the elderly and those not employed exhibit particular expenditure patterns on, and lower satisfaction levels with, some utility services. However, this relationship is uneven and depends on the socio-economic category and service in question. We conclude by highlighting five findings which may be of use to policy-makers when considering whether demand-side regulatory policies are required

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1 Introduction

Consumer satisfaction is widely acknowledged as being an important issue for firms and consumers' associations (Fornell et al. 1996; McColl-Kennedy and Schneider 2000; Szymanski and Henard 2001), and, increasingly, for governments, regulators, and international institutions (Muzzini 2005; OECD 2008). The number of surveys implemented to measure consumer satisfaction with a range of goods and services has grown from the 1990s (Peters and Pierre 1998; Anderson and Fornell 2000; Johnson et al. 2001; Vigoda-Gadot et al. 2010). In particular, there has been an increase in the number of consumer satisfaction surveys on utilities. Data on satisfaction with utility services are available in a range of national surveys, such as in the US (ACSI 2013), Sweden, (Fornell 1992), Korea, New Zealand, Norway, Taiwan (Johnson et al. 2001) and the United Kingdom (UK) (NCSI-UK 2013). The European Union (EU) has also invested considerable resources in conducting in-depth evaluation on consumer satisfaction with utilities. The results of these surveys have been published in a series of surveys known as *Eurobarometers* (EC 2013).

Analysis of consumer satisfaction with utilities as reflected in these surveys has led to two important and inter-related findings. Firstly, unsurprisingly, consumer satisfaction is often uneven. Secondly, where surveys include information on the socio-economic background of respondents, patterns have emerged suggesting that consumers from particular socio-economic backgrounds may be prone to express lower satisfaction than their peers, at least, for some utilities. This pattern has started to concern intergovernmental organizations, including the European Commission (EC), the Organization for Economic Cooperation and Development (OECD) and the World Bank (Muzzini 2005; OECD 2008; EC 2010a; ECCG 2013). These organizations have joined with several governments to promote collaborative research in order to explore the potential relationship between consumers' socio-economic background and satisfaction levels with utilities, as well as other goods and services (Australian Government 2007; Federal Trade Commission 2007; Institute for Government 2010; EC 2008, 2010b, 2012; OECD 2008, 2010).

Two main questions guide this research. The first concerns whether those expressions of lower satisfaction associated with consumers belonging to particular socio-economic categories may be analyzed through the concept of a potentially "vulnerable consumer" (OECD 2008; EC 2012). The term potentially vulnerable consumer is used to refer to a consumer who may find him/herself at a disadvantage in the market, due to one or more features of their socio-economic background. This concept is elaborated further in Sect. 2. Secondly, this research enquires whether new approaches inspired by Behavioral Economics might be used to understand better any

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relationship detected between a potentially vulnerable consumer and lower expressions of satisfaction, with a view to considering applying policy that aims to improve satisfaction levels of consumers from particular socio-economic groups. The research evokes in particular the concepts of "libertarian paternalism" (Thaler and Sunstein 2003) and "asymmetric paternalism" (Camerer et al. 2003) as possible guides to new approaches to regulation.

The aim of this paper is to contribute to ongoing debates about consumer satisfaction with utilities, focusing on whether and, if so, how, uneven expressions of satisfaction can be explained by consumers' socio-economic background. Our aim is to provide empirical evidence which could serve as a starting point for further exploration of consumer satisfaction and the potential for paternalistic/asymmetrical regulation, concerns currently being discussed inside regional and international organizations and national governments around the world.

To do so, we examine consumers' socio-economic background and their satisfaction with, and their expenditure decisions on, five utility services—electricity, gas, fixed phone, cellular phone and the Internet—across twelve European countries. Our analysis of the socio-economic background of consumers focuses on three important variables for which we have comparable data: age, education and employment status. The elderly, the less educated and those who do not work are common categories in discussions on potentially vulnerable consumers (EP 2012). Rather than examining satisfaction alone, our approach, following Whitehead et al. (2008), is to contrast data on consumer satisfaction (Stated Preferences, henceforth, SP) with data on household expenditure (Revealed Preferences, RP). We use data on consumer satisfaction with utilities, as found in the *Eurobarometer* series, and contrast these with data on expenditure obtained from Household Budget Surveys (HBS), collected by the European Statistical Office, EUROSTAT (EUROSTAT 2011). We analyze a single, European-wide survey on consumer satisfaction, EC (2007). This survey was unique in that it included comprehensive information on the relationship between satisfaction and the socio-economic background of both subscribers and non-subscribers of utility services.[1] Surveys before and after EC (2007) screened out non-subscribers, and only captured the relationship between subscribers, satisfaction and socio-economic background, ignoring the potentially interesting relationship between non-subscribers, satisfaction and socio-economic background. EC (2007) therefore captured data on those consumers who did not subscribe due to low satisfaction and/or no access.

To anticipate our findings, we do not find that all three of our indicators on socio-economic background are consistently associated with expenditure and satisfaction patterns across the five utilities under analysis. Our results instead suggest that *some* of the socio-economic indicators are associated with particular expenditure and satisfaction levels for *some* of the services considered.

The rest of the paper is organized as follows. The second section describes the theoretical and policy issues behind the increased attention to consumer satisfaction and consumers' socio-economic background in the context of utilities. The third and fourth sections provide the data and set out the hypotheses and the econometric model, respec-

[1] Surveys after EC (2007) also differed in that they dropped questions on access and price satisfaction (EC 2010a).

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tively. The fifth section discusses the results for SP and RP, and sheds light on reasons for differences in consumer satisfaction based on their socio-economic background. The conclusions explain why our findings may be of potential use to policy-makers considering adopting a form of regulation based on paternalistic approaches inspired by Behavioral Economics.

2 Utilities and consumer satisfaction

With the rise of consumer satisfaction surveys on utilities, governments and international organizations have demonstrated concern that consumers from particular socio-economic backgrounds may express lower levels of satisfaction than their peers (OECD 2008; EP 2012; ECCG 2013). Ongoing collaborative research between governments and these organizations seeks to explore the potential relationships between consumers' socio-economic background and expressed satisfaction, explain these relationships, and propose possible policy solutions to improve satisfaction of these socio-economic groups (Australian Government 2007; Federal Trade Commission 2007; Institute for Government 2010; EC 2008, 2010b, 2012; OECD 2008, 2010).

Regulators, governments and scholars have generally acknowledged that utilities have become a more complex experience for consumers, partly as a result of greater consumer choice and technological change (ECCG 2013). Scholars have focused for instance on new complexities associated with more consumer choice in the age of competition among suppliers or, post-subscription issues around switching. For example, Giulietti and Waddams Price (2005) observed consumer difficulties associated with the "small print" in contracts, as well as the perceived high costs as regards information gathering, analysis and decision-making by the consumer. Wilson and Waddams Price (2010) showed that switching did not always lead to better options and welfare maximization.

The concern is that if utility markets are complex in general, making all consumers potentially vulnerable, this complexity will likely be considerably more challenging for some than others. Discussions on potentially vulnerable consumers have focused primarily on consumers' specific socio-economic background. The concept of the vulnerable consumer and related socio-economic indicators can be found in a whole range of policy documents by intergovernmental organizations, including the OECD (2008) and the EC (2012), as well as in scholarly research. A useful definition of potentially vulnerable consumers is those who "are at a disadvantage in exchange relationships where that disadvantage is attributable to characteristics that are largely not controllable by them" (Andreasen and Manning 1990, p. 13). Vulnerability is generally perceived as a multi-dimensional category, which may be manifested in one market but not necessarily in another. Moreover, vulnerability may often not be captured by means-testing alone (OFGEM 2012; Stearn 2012; EP 2012). Because vulnerability is not directly observable, its analysis is generally done by considering specific socio-economic characteristics which are taken as representative of *potential* vulnerability. Most commonly, seven key indicators are consistently included: (1) age (the very elderly/young); (2) those with low incomes; (3) those who do not work; (4) the long-term disabled; (5) those with lower educational attainments; (6) rural dwellers and (7) ethnic minorities (OFT 1998; OECD 2008).

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George et al. (2011) have provided insight into how these characteristics—independent of income—may render some consumers more vulnerable than others. For example, the elderly are more likely to have sight, hearing or cognitive impairment than their peers, which may create difficulties in their accessing, processing and acting upon information in the market. Those with lower educational attainment may be more exposed to cognitive limitations due to a lack of literacy or numeracy skills, or lower confidence in the market. Consumers who do not work may be less exposed to social and professional networks where information about the market and technological change circulates, therefore less likely to benefit from peer learning. Consumers who belong to one or more of these categories, such as lesser educated, elderly consumers, may find it more challenging to penetrate a complex market than their peers (George et al. 2011; Stearn 2012).

Governments and international organizations have demonstrated they consider the potential associations between vulnerable consumers and satisfaction as part of their remit to protect consumers and govern society. For example, the EC (2008, 2010b) organized a series of international conferences to explore how regulation could be introduced to address the question of the vulnerable consumer and associated lower satisfaction. Satisfaction with utilities was at the center of these debates. Participants, including the Australian Government (2007), the US Federal Trade Commission (2007), the Institute for Government of the UK (2010), and the OECD (2008, 2010) reached consensus on two important issues. Firstly, given empirical evidence from around the world which linked lower satisfaction with consumers' socio-economic background, it was worthwhile considering if and how regulation could ameliorate this. In particular, it was argued more attention to demand or consumer-side regulation was required. OECD (2008, 2010) argued that, for telecommunications and electricity markets to work, supply-side regulation was insufficient. OECD stated that demand-side regulation should focus on two concerns: consumers should receive adequate information flows and their potential behavioral biases should be corrected. Secondly, they agreed that Behavioral Economics was a useful platform from which new regulation could be designed. Since then, the momentum has continued. For example, OECD (2010), EC (2012) and the European Parliament (EP 2012) continue to promote more attention to demand-side regulation.

Behavioral Economics is considered a useful starting point to reconsider demand-side regulation because, working from neo-classical economic foundations, it establishes that consumers do not always behave as absolute rational and selfish agents, who maximize their own utility when taking decisions (Mullainathan and Thaler 2000; Thaler and Sunstein 2003). Instead, its proponents state that consumers suffer psychological biases, and take decisions in conditions of "bounded rationality" and "flawed heuristics" (Cooper and Kovacic 2012, p. 45). Behavioral Economics focuses on identifying and understanding the psychological *and* economic reasons for why consumers fail to systematically behave in their own interests (Camerer et al. 2003). Kahneman et al. (1982) argued that decision-making is based on heuristics derived from the environment, which can be characterized by uncertainty and complexity. Consumers' social, cultural and economic environment, therefore, may influence behavior, leading to potentially heterogeneous outcomes. Behavioral Economics therefore has been mobilized to help better understand why consumers with particular socio-economic

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backgrounds, as potentially vulnerable consumers, may take sub-optimum decisions in the market (Consumer Focus 2010). Because vulnerability is multidimensional, and cannot be captured solely by means-testing, its presence will be heterogeneous, depending both on the characteristics which represent it as well as the complexity of the market in question. Behavioral Economics posits that common consumer behaviors in markets include inertia, risk aversion or passivity, which may lead to sub-optimal decisions. Explanations for these behaviors include loss aversion and impatience (see Dohmen et al. 2010 and Hjorth and Fosgerau 2011), status quo bias (Kahneman et al. 1991; Thaler and Sunstein 2003), and choice overload (Iyengar and Lepper 2000; Haynes 2009). Behavioral experiments have demonstrated that consumers from particular socio-economic groups may be more inclined to these biases than their peers (Lunn and Lyons 2010).

Within the Behavioral Economics literature, Thaler and Sunstein (2003) describe "libertarian paternalism", whereby policy is introduced which, while ensuring that freedom to choose is preserved, "steers" consumers towards taking a decision which would improve their welfare. Policy would be introduced only after cost-benefit analysis. Because steering may be costly to implement and could even end up preventing individuals from behaving in their best interests, Camerer et al. (2003) have proposed "asymmetric paternalism", to ensure that only that regulation which will create significant benefits for potentially vulnerable consumers, while imposing little or no negative costs on their peers, can be justified. An example of this approach is to request service providers to reframe contracts and bills in easily understandable terms, which is unlikely to harm any consumer but could help potentially vulnerable ones. This would not be necessary, however, from the point of view of improving consumer welfare, where specific socio-economic groups of consumers did not express lower satisfaction with particular markets linked to different expenditure decisions.

Policy-makers have already started introducing asymmetric paternalistic regulation in an attempt to address consumer vulnerability. In the UK, efforts have been made to improve the clarity and comparability of utility tariffs with potentially vulnerable consumers in mind (Stearn 2012). OFGEM (2012) has stated energy providers should ensure meter readings, bills and contract information, be accessibly presented in view of market complexity and potential difficulties experienced by vulnerable consumers. Consumer Focus, the public body representing consumer interests in basic markets, has promoted "Consumer Vulnerability Action" in markets which provide basic goods and services (Stearn 2012). The European Parliament (EP 2012) and European consumer groups (ECCG 2013) have similarly called for rules whereby service providers ensure information about their service is understandable and comparable for all consumers. It is in the context of these emerging concerns about introducing better demand-side policy that this paper seeks to examine closely the empirical evidence on the relationship between satisfaction and consumers' socio-economic background.

3 Data and approach

Our empirical research is based on the complementary analysis of consumers' SP and RP in regard to five services: electricity, gas, fixed and cellular telephony, and Internet

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services. Traditionally, economists have focused on RP alone. Following Samuelson (1938), the economic theory of consumer behavior was based on RP, inferred from consumers' expenditure decisions in the market in response to different price combinations. Recent examples of the use of RP in research on utilities include Cardona et al. (2009) and Glass and Stevanova (2010), which examine the relationship between Internet usage and consumers' socio-economic background.

Increasingly, scholars have argued that other approaches should be used as a supplement to RP to better understand consumer behavior. In a state-of-the-art of the field, Whitehead et al. (2008) demonstrated how complementing RP with SP analysis helped maximize the respective strengths of each approach, whilst minimize their weaknesses, therefore enriching data interpretation and the results obtained. SP are consumers' self-assessment of their evaluation of, or satisfaction with, a particular product or service. SP may help researchers understand some of the reasons for a given consumer's behavior. Frey and Stutzer (2002) argue that, through stating preferences, individuals evaluate their level of subjective wellbeing by comparing this with that of other people, past experiences and future expectations. They claim that reported subjective well-being is a valid and empirically adequate measure for human wellbeing, which can be modeled in a micro-econometric function using independent variables such as individual socio-demographic and socio-economic characteristics. Despite this, few attempts have been made to evaluate the regulation of utility services using SP (exceptions include Clifton and Díaz-Fuentes 2010), so little is still known about how socio-economic characteristics may influence decision-making in this field.

It is through the complementary analysis of RP and SP that new insights can be gleaned about consumers' experiences with utilities. The advantage of RP is that they are based on actual choices (expenditure) whilst their disadvantage is that they rely on historical data, as actual behavior in response to new policies does not exist. The advantage of SP is that hypothetical policy scenarios can be tested for (such as non-use values) whilst their major disadvantage lies in their advantage: they may be hypothetical so replies may be unrealistic (Whitehead et al. 2008: 875). The complementary analysis of SP and RP has been applied across different disciplines, including environmental valuation and transport, but not yet to analyzing utility services across multiple countries.

We follow Kahneman and Thaler (2006) description of the decision-making process, which is divided into two stages: firstly, individuals make a choice, RP and, secondly, they obtain a degree of satisfaction from that choice, SP. As discussed in Sect. 2, the socio-economic background of a consumer may influence the choices a consumer makes in a market. Regarding SP, we assume that an association between expressions of lower satisfaction and a particular socio-economic category is of potential concern for regulators. Regarding RP, we assume that expenditure on a service is derived from its unit price multiplied by the quantity purchased: this can be understood both in quantitative terms (the *amount* of the service purchased); and in qualitative terms (the *quality* of the service purchased). By contrasting SP and RP we can therefore identify and then interpret three main scenarios: (1) A particular group of consumers is associated with *lower satisfaction* and *lower expenditure* on a service. This could be interpreted as a situation where consumers purchased a *smaller amount* of that service (for instance, by limiting the number of phone calls they make) or, because they

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purchased a *lower quality* service (such as contracting a poorer Internet connection). So, this group of consumers may have either restricted their consumption in the market or opted for a poor quality service: as a result, their satisfaction is lower than their peers; (2) A group of consumers is associated with *lower satisfaction* with, but *higher expenditure* on, a service. This could be interpreted as indicating that these consumers are paying a higher unit price for the service—as they took a poorer consumption decision—and this is reflected in lower satisfaction; (3) A group of consumers is *less satisfied* than their peers but have *similar* expenditures. This could be interpreted as indicating either their expression of satisfaction is inconsistent, or, that they are paying a higher unit cost whilst at the same time restricting their consumption in the market, hence the effect on expenditure is ambiguous.

We first proceed to analyze SP, in order to test whether patterns exist between socio-economic groups and different levels of satisfaction, after which we analyze RP, to complement the analysis with SP and, on that basis, explain our findings on the relationship between consumers' socio-economic background and satisfaction.

Data on SP are derived from EC (2007). This is one of a series of EU-wide surveys conducted on consumer satisfaction with utilities. Other surveys include EC (1997, 2000, 2002, 2003, 2005, 2007, 2010a). As mentioned in Sect. 1, we use EC (2007), as this is a unique survey which provides information on consumer satisfaction disaggregated by socio-economic background including the opinion of non-subscribers. EC (2007) provides a wealth of information on consumers' opinions on a range of utilities, including use, accessibility, affordability and importance of these utility services.

Data on RP are available through the EU Statistical Office (EUROSTAT). In the EU, national governments compile HBS, which includes information on households' expenditure broadly disaggregated, as well as the socio-economic characteristics of the household representative. EUROSTAT collects and homogenizes these national data and produces a European-wide database on a regular basis. The most recent Europe-wide HBS corresponds to the period 2004-6 (EUROSTAT 2011).

Although EC (2007) includes information from 25 European countries, the EUROSTAT HBS does not include information on the Czech Republic, Italy, Malta, Poland and Portugal, nor does it include sample weights for Cyprus, Luxembourg, the Netherlands and Slovenia. In addition, the EUROSTAT HBS information is incomplete regarding the dependent and independent variables required for estimations for Austria, Germany, Sweden and the UK. Hence, our final data set is complete for twelve countries (over 166 million inhabitants), which are representative of Europe in that they include economies representing geographical and socio-political diversity (Northern, Central, Western, Southern and Eastern countries), size (large, medium and small countries) and economic development (more and less developed countries).[2]

Stated use of utility services is presented in Table 1. As these are essentially individuals' judgments, SP may be subject to biases (Frey and Stutzer 2002). With the exception of a very small percentage of stated non-use, which may be derived from

[2] The sample from EC (2007) includes 12,263 observations and the sample from EUROSTAT (2011) has 71,124 observations. Detailed information on sample sizes by country will be provided by authors on request.

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Table 1 Stated use of energy and telecommunications services in the 12 European countries, 2006

	Stated use (%)
Energy	
Electricity	95.9
Gas	53.0
Electricity and/or gas	96.7
Telephone	
Fixed telephone	77.7
Cellular telephone	79.7
Fixed and/or cellular tel.	97.5
Telecommunications	
Internet	44.5
Fixed and/or cellular tel. and/or internet	97.7

Source Computed by authors based on EC (2007)

Table 2 Percentage of stated satisfaction with the price of energy and telecommunications services in the 12 European countries, 2006

	Consumers (full sample) (%)	Subscribers of the service (%)
Energy		
Electricity	67.72	69.18
Gas	44.13	64.14
Telecommunications		
Fixed telephone	65.23	72.90
Cellular telephone	61.74	71.53
Internet	48.36	79.19

Source Computed by authors based on EC (2007)

inherent SP biases, we observe that, among energy services, electricity is universally used, whilst gas is not. As regards telephone services, observed separately, both fixed and cellular telephony are broadly used, but neither are used universally. However, when fixed and cellular telephony are considered together, at least one of them is used by practically the whole population. This suggests that, for a considerable part of the population, these technologies have become substitutable (Briglauer et al. 2011). Finally, the Internet is not universally used. When both energy (electricity and gas) and telecommunications (fixed, cellular and Internet) are considered as aggregate categories, they are used by practically the whole population.

Stated satisfaction with service price is presented in Table 2. The table includes both the percentage of satisfaction with price for the full sample of population ("Consumers") and also price satisfaction for those who actually use each service ("Subscribers"). Observing first "Consumers" price satisfaction, we see that service use and satisfaction are linked: the service with broadest use—electricity—is also the one to receive greatest satisfaction (nearly 68 %). The other two broadly used services—fixed and cellular telephony—also receive a satisfaction score of over 60 %. The two services with lowest use—gas and the Internet—score below 50 %. Turning to

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"Subscribers", we note how satisfaction in general is significantly higher than that expressed by "Consumers". "Subscribers" express a satisfaction rate of between 64 and 79 % for all services, whilst telecommunications services all score highly, between 70 and 80 %. These data suggest that lower satisfaction with a service appears to be associated with non-subscription, particularly as reflected in the cases of gas and the Internet. We now proceed to present the empirical analysis.

4 The empirical model

To examine possible associations between consumers' socio-economic background, expenditure on and satisfaction with utilities, the following two hypotheses are proposed:

1. Consumers' socio-economic characteristics condition their satisfaction with the price of services. If this is found to be the case, our analysis will seek to identify which socio-economic characteristics are related to lower satisfaction.
2. Consumers' socio-economic characteristics associated with lower satisfaction with price are also related to expenditure on services. If this is the case, attention will be turned to whether expenditure is greater or less than average.

With respect to SP, three different estimations are performed for each of the five services. In the first estimation, the dependent variable is the probability of satisfaction with the price of the service for the whole sample of consumers. Next, two additional estimations are performed: firstly, using the probability of subscribing to the service as a dependent variable; secondly, using subscribers' probability of price satisfaction. This approach makes it possible to identify to what extent an expression of lower satisfaction is associated with a lower probability of being a subscriber and/or to being less satisfied when subscribing.

Satisfaction with the price of a service is defined by the latent variable y_i^*, with the form:

$$y_i^* = x_i'\beta + u_i$$

where

i is an individual consumer.

x_i is a vector of independent variables for the individual i.

Information about service characteristics at the individual consumer level is not available, with the exception of the Internet. Our estimations may therefore be subject to the common issue of omitted variable bias (Yatchew and Griliches 1985). Using information about Internet service characteristics (broadband and dial-up) does not affect our main results. Most of the services under analysis (electricity, gas, fixed telephony) are essentially homogeneous for the consumer (OECD 2001). Despite this, our results should be interpreted as reliable proxies of the effects of socio-economic background on consumer satisfaction.

In practice, y_i^* is not observable. Instead, we observe a binary variable defined as:

$y_i = 1$, if $y_i^* > 0$, in case that the individual i states they are satisfied with the price of the service.

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$y_i = 0$, if $y_i^* \leq 0$, otherwise.

From this, we obtain:

$$\Pr(y_i = 1) = \Pr(y_i^* > 0) = \Pr(x_i'\beta + u_i > 0) = \Pr(-u_i < x_i'\beta) = F(x_i'\beta)$$

Then, assuming that the error u is distributed as a standard normal we obtain the probit model:

$$\Pr(y_i = 1) = \Phi(x_i'\beta)$$

From this model, we estimate the marginal effects of changes in each independent variable x_j on consumers' probability of being satisfied with the price of each service from the following equation

$$\frac{\partial \Pr(y_i = 1)}{\partial x_{ij}} = \Phi(x_i'\beta)\beta_j$$

Next, following the same assumptions, the effects of the independent variables x_i on the probability of subscribing to a service are estimated from the following binary probit model:

$$\Pr(s_i = 1) = \Phi(x_i'\gamma)$$

where

$s_i = 1$, in the case that the individual i states he or she uses the service.

$s_i = 0$, otherwise.

Whilst for the sample of subscribers, we estimate $\Pr(y_i{=}1)$ from a binary probit model:

$$\Pr(y_i = 1 | s_i = 1) = \Phi(x_i'\kappa)$$

And thus we similarly obtain the marginal effects of changes in each independent variable x_j associated with these two additional estimations.

As regards RP, the dependent variable is the logarithm of households' expenditure on a category of services, expressed in Euros per year. To analyze RP, two categories of services are used: energy (electricity and gas) and telecommunications (fixed telephony, cellular telephony and Internet), since no further disaggregation of information by individual telecommunications services is conducted in the EUROSTAT HBS. For each category, the dependent variable is analyzed from an OLS equation:

$$\ln(EXP_i) = x_i'\xi + u_i$$

where

EXP_i is household i expenditure on a category of services.

x_i is a vector of independent variables for household i.

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The independent variables (x) have been selected following the literature on potentially vulnerable consumers, as discussed in Sect. 2. Of those socio-economic variables associated with potentially vulnerable consumers, comparable data available across both the *Eurobarometer* and the HBS include: (1) age; (2) employment status; and (3) education. Data are incomplete or not comparable for low income, disabilities, ethnic minorities and rural dwellers, unfortunately. Our selection of independent variables focuses therefore on these three dimensions representative of potential vulnerability: age (the elderly); employment (non-employment) and education (basic). In addition, we include control variables to correct for the most important factors which may influence satisfaction with and/or expenditure on utility services. We include dummy variables representing the country of residence to capture differences in prices between countries as well as any other unobservable specific factors inherent to each separated market. As control variables we also include household size, to capture the effect of the scale on consumption; housing occupancy status, differentiating home-owners from those who rent; and, in the case of RP, household income, as the dependent variable is expressed in monetary terms.

In our analysis of SP, the three dimensions of consumers' potential vulnerability are captured by the following independent variables: employment, the non-employed (*NOOCUP*) compared with the employed; age, those over 64 and those over 74 (*FROM65TO74* and *MORE74*) versus the middle-aged and the young; and education, the lesser-educated (*EBASIC*) versus those with higher education (category of reference). Control variables include: the country, France being the category of reference; household size, a two-person household being the category of reference; and housing occupancy status, where we compare non-owners (*NOHOUSEPR*) with owners. As stated, we assume a potential concern for regulators may exist where consumers with a particular socio-economic background are less satisfied than their peers. Next, we evaluate if this is also reflected in expenditure patterns and, if so, how.

Regarding RP, we focus on the same three dimensions to represent consumers' potential vulnerability: employment, comparing households where no members are employed (*NONEOCUP*) versus households with two or more employed members (category of reference); the age of the reference person, comparing those over 64 and over 74 (*RP FROM65TO74* and *RP MORE74*) versus the middle-aged and young; and the education of the reference person, comparing the lesser-educated (*RP EBASIC*) with those with higher education (category of reference). Control variables include the country, with France as the category of reference; household size, by the number of household members and this variable squared; housing occupancy status, comparing non-owners (*NOHOUSEPR*) to owners; and the logarithm of a household's total equivalent expenditure, according to the OECD scale (*lnSPENDEQ*).

5 Estimation results

Our estimations for SP on consumers' satisfaction with service price are shown in Table 3. Additional estimations on the probability of subscription and on subscribers' satisfaction are included in Tables 4 and 5, respectively. Estimations on household expenditure on services, RP, are shown in Table 6. We organize the discussion of our

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Table 3 Marginal effects on consumers' satisfaction with service price

	Variable	Electricity	Gas	Fixed tel.	Cellular t.	Internet
		Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.
Country	*BELGIUM*	0.112***	0.183***	0.109***	0.212***	0.080***
		(0.018)	(0.023)	(0.020)	(0.017)	(0.024)
	DENMARK	0.161***	−0.124***	0.128***	0.273***	0.121***
		(0.017)	(0.022)	(0.019)	(0.015)	(0.025)
	ESTONIA	0.033	−0.108***	−0.138***	0.211***	−0.180***
		(0.021)	(0.023)	(0.024)	(0.017)	(0.023)
	FINLAND	−0.256***	−0.382***	−0.225***	0.263***	0.033
		(0.023)	(0.014)	(0.023)	(0.015)	(0.024)
	GREECE	0.195***	−0.086***	0.187***	0.242***	−0.099***
		(0.017)	(0.023)	(0.018)	(0.017)	(0.024)
	HUNGARY	0.032	0.164***	−0.030	0.223***	−0.205***
		(0.021)	(0.024)	(0.023)	(0.018)	(0.023)
	IRELAND	0.002	−0.108***	0.051**	0.193***	−0.157***
		(0.021)	(0.023)	(0.022)	(0.018)	(0.023)
	LATVIA	0.066***	0.019	−0.167***	0.097***	−0.252***
		(0.020)	(0.024)	(0.024)	(0.021)	(0.020)
	LITHUANIA	0.252***	0.309***	0.018	0.266***	−0.020
		(0.012)	(0.021)	(0.022)	(0.014)	(0.025)
	SLOVAKIA	0.145***	0.331***	0.074***	0.262***	−0.256***
		(0.018)	(0.021)	(0.021)	(0.015)	(0.021)
	SPAIN	0.087***	0.183***	0.053**	0.159***	−0.014
		(0.021)	(0.024)	(0.022)	(0.022)	(0.026)
Employment	*NOOCUP*	−0.017	−0.042**	−0.007	−0.068***	−0.049**
		(0.018)	(0.019)	(0.018)	(0.019)	(0.019)
Age	*LESS35*	0.009	0.011	0.014	0.072***	0.109***
		0.021	(0.022)	(0.021)	(0.022)	(0.022)
	50TO64	−0.016	−0.016	0.020	−0.017	−0.064***
		(0.023)	(0.024)	(0.023)	(0.025)	(0.024)
	65TO74	−0.011	−0.027	0.035	−0.147***	−0.249***
		(0.030)	(0.032)	(0.030)	(0.034)	(0.028)
	MORE74	−0.022	−0.002	0.052	−0.270***	−0.315***
		(0.035)	(0.037)	(0.033)	(0.037)	(0.028)
Education	*EBASIC*	−0.042*	−0.041*	−0.087***	−0.082***	−0.195***
		(0.021)	(0.023)	(0.022)	(0.023)	(0.022)
	ESECOND	−0.035*	−0.032	−0.043**	0.004	−0.105***
		(0.019)	(0.020)	(0.019)	(0.020)	(0.020)

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Table 3 continued

	Variable	Electricity	Gas	Fixed tel.	Cellular t.	Internet
		Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.
Control variables	*ONEPERS*	−0.019	−0.014	−0.047**	−0.056**	−0.062***
		(0.021)	(0.023)	(0.022)	(0.023)	(0.024)
	THREEPERS	−0.023	−0.007	0.024	0.032	0.077***
		(0.023)	(0.024)	(0.023)	(0.024)	(0.025)
	FOURPERS	−0.060**	0.013	0.023	0.003	0.070***
		(0.025)	(0.026)	(0.024)	(0.026)	(0.026)
	MOREFOURP	−0.039	−0.039	0.026	−0.002	0.023
		(0.028)	(0.029)	(0.027)	(0.030)	(0.030)
	NOHOUSEPR	−0.101***	−0.014	−0.108***	−0.085***	−0.092***
		(0.019)	(0.020)	(0.019)	(0.021)	(0.020)
N		12,263	12,263	12,263	12,263	12,263
Wald chi^2		889.40	1,546.26	748.65	812.54	1036.89
Prob > chi^2		0.000	0.000	0.000	0,000	0,000

Standard errors in parenthesis. Statistical significance at 1 % (***), 5 % (**), 10 % (*)
Source Computed by authors based on EC (2007)

findings by considering the three categories associated with consumers' potential vulnerability: educational attainment; employment status and age.

Education Consumers with basic education are less satisfied with prices of all the services under analysis when compared to consumers with higher education. However, the satisfaction "gap" between these groups of consumers varies considerably among services. This gap is considerably wider for telecommunications than for energy services. The lesser-educated have a −8.7, −8.2 and −19.5 % probability of being satisfied with fixed telephony, cellular telephony and Internet services, respectively, than their better-educated counterparts; the difference in satisfaction for electricity and gas is less significant, at −4.2 and −4.1 %, respectively. Turning to RP, consumers with basic education spend much *less* on telecommunications (−17.5 %) than their more educated counterparts, whilst they spend slightly *more* on energy (electricity and gas) (+2.9 %).

By complementing SP and RP results for telecommunications, we interpret that the difficulties experienced by consumers with a basic education, associated with pronouncedly lower satisfaction levels, are translated into a reduced participation in these markets, reflected in their lower expenditure. This is confirmed by additional findings on SP (Table 4) which show that the less-educated are also less likely to be subscribers of fixed telephony (−10.5 %), cellular telephony (−9.1 %) and, particularly, Internet services (−26.2 %). Clearly, cellular telephony and Internet have become substitute services to traditional telephony for all consumers. This finding is consistent with a recent econometric study by Macher et al. (2012) on households' telephony choices in the US. Consumers' lower expenditure could well be explained by careful use of substitutes to save money. However, the fact that this category of consumers expresses

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Table 4 Marginal effects on consumers' probability of subscribing to a service

	Variable	Electricity	Gas	Fixed tel.	Cellular t.	Internet
		Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.
Country	*BELGIUM*	0.012	−0.037	−0.137***	0.050***	0.069***
		(0.009)	(0.023)	(0.024)	(0.014)	(0.025)
	DENMARK	0.016**	−0.310***	0.007	0.089***	0.300***
		(0.008)	(0.019)	(0.020)	(0.012)	(0.024)
	ESTONIA	−0.037**	−0.285***	−0.404***	0.048***	−0.115***
		(0.014)	(0.020)	(0.026)	(0.014)	(0.023)
	FINLAND	0.010	−0.510***	−0.398***	0.113***	0.230***
		(0.009)	(0.010)	(0.025)	(0.010)	(0.024)
	GREECE	–	−0.521***	0.051***	0.014	−0.279***
		–	(0.012)	(0.018)	(0.016)	(0.019)
	HUNGARY	−0.024*	0.286***	−0.352***	−0.020	−0.277***
		(0.013)	(0.021)	(0.026)	(0.018)	(0.019)
	IRELAND	0.001	−0.189***	−0.013	0.059***	−0.045*
		(0.010)	(0.022)	(0.021)	(0.014)	(0.025)
	LATVIA	0.008	−0.057**	−0.357***	−0.026	−0.218***
		(0.009)	(0.024)	(0.026)	(0.019)	(0.020)
	LITHUANIA	−0.016	0.073***	−0.542***	−0.037**	−0.198***
		(0.012)	(0.024)	(0.023)	(0.019)	(0.021)
	SLOVAKIA	0.016*	0.363***	−0.363***	−0.013	−0.303***
		(0.009)	(0.018)	(0.027)	(0.018)	(0.017)
	SPAIN	−0.031***	0.079***	−0.078***	0.006	−0.147***
		(0.012)	(0.025)	(0.022)	(0.017)	(0.025)
Employment	*NOOCUP*	0.004	−0.015	−0.040***	−0.089***	−0.043**
		(0.007)	(0.021)	(0.014)	(0.014)	(0.020)
Age	*LESS35*	−0.010	0.010	−0.061***	0.101***	0.112***
		(0.009)	(0.024)	(0.017)	(0.017)	(0.023)
	50TO64	0.011	0.058**	0.122***	−0.120***	−0.086***
		(0.009)	(0.026)	(0.014)	(0.023)	(0.024)
	65TO74	0.008	0.055	0.171***	−0.312***	−0.294***
		(0.011)	(0.035)	(0.011)	(0.036)	(0.024)
	MORE74	−0.008	0.066*	0.180***	−0.518***	−0.359***
		(0.016)	(0.039)	(0.010)	(0.039)	(0.023)
Education	*EBASIC*	−0.009	−0.031	−0.105***	−0.091***	−0.262***
		(0.011)	(0.025)	(0.019)	(0.018)	(0.021)
	ESECOND	−0.015*	−0.004	−0.046***	−0.013	−0.144***
		(0.009)	(0.022)	(0.015)	(0.017)	(0.020)

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Table 4 continued

	Variable	Electricity	Gas	Fixed tel.	Cellular t.	Internet
		Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.
Control variables	*ONEPERS*	−0.008	−0.024	−0.107***	−0.049***	−0.121***
		(0.010)	(0.025)	(0.021)	(0.017)	(0.024)
	THREEPERS	−0.003	0.051**	0.051***	0.011	0.066**
		(0.010)	(0.026)	(0.016)	(0.018)	(0.026)
	FOURPERS	0.002	0.068**	0.094***	−0.029	0.139***
		(0.010)	(0.027)	(0.015)	(0.023)	(0.027)
	MOREFOURP	−0.003	−0.011	0.064***	−0.038	0.093***
		(0.013)	(0.032)	(0.018)	(0.025)	(0.031)
	NOHOUSEPR	−0.010	0.085***	−0.152***	−0.034**	−0.133***
		(0.009)	(0.021)	(0.016)	(0.016)	(0.020)
N		11,263	12,263	12,263	12,263	12,263
Wald chi^2		86.88	2,629.66	1,378.03	1,110.65	1,595.44
Prob > chi^2		0.000	0.000	0.000	0,000	0,000

Standard errors in parenthesis. Statistical significance at 1 % (***), 5 % (**), 10 % (*)
Source Computed by authors based on EC (2007)

lower satisfaction points to other explanations for their lower expenditure. It is interesting that less-educated consumers who are also subscribers have "only" a −4.5 % lower score in satisfaction than their peers for fixed telephony, whilst satisfaction differences are not significant for cellular telephony and the Internet (Table 5). This suggests that market complexity, including complex product packages and contracts, and inertia towards new technologies, may be acting as deterrents to participation in these services. In contrast to lower expenditure on telecommunications services, the lesser educated spend relatively *more* on energy services than their peers. We surmise that lower satisfaction with the price of electricity and gas services combined with higher expenditure may reflect poorer consumption decisions taken by this group as regards energy-saving strategies and/or choice of the best providers, as documented by Stearn (2012, p. 24).

Employment status Consumers who are not employed express lower satisfaction levels with the price of cellular telephony (−6.8 %) and the Internet (−4.9 %), while satisfaction levels with fixed telephony are not significant, unlike the lesser educated, as discussed. Turning to RP, households with no employed members spend *much less* on telecommunications (−20.3 %) than the category of reference. This is borne out in our data which show that consumers in this group are less likely to subscribe to cellular telephony (−8.9 %) and to the Internet (−4.3 %) than their peers. This is in turn reflected in their lower satisfaction levels, which may explain their restricted participation in these markets. At the socio-economic level, this could create a vicious circle for this group, since fast and reliable communication is often required when seeking a job. As regards energy, consumers who are not employed are less satisfied with the price of gas (−4.2 %); though the results for electricity are not significant.

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Table 5 Marginal effects on subscribers' satisfaction with service price

	Variable	Electricity	Gas	Fixed tel.	Cellular t.	Internet
		Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.
Country	*BELGIUM*	0.104***	0.217***	0.147***	0.176***	−0.006
		(0.018)	(0.021)	(0.016)	(0.015)	(0.026)
	DENMARK	0.154***	0.215***	0.157***	0.220***	−0.018
		(0.017)	(0.026)	(0.016)	(0.012)	(0.026)
	ESTONIA	0.043**	0.220***	0.051**	0.186***	−0.136***
		(0.021)	(0.025)	(0.022)	(0.013)	(0.035)
	FINLAND	−0.263***	−0.042	−0.084***	0.197***	−0.082***
		(0.023)	(0.093)	(0.026)	(0.013)	(0.028)
	GREECE	0.182***	0.302***	0.182***	0.232***	0.083***
		(0.016)	(0.030)	(0.015)	(0.013)	(0.029)
	HUNGARY	0.042*	0.077***	0.075***	0.219***	−0.099**
		(0.021)	(0.027)	(0.022)	(0.014)	(0.041)
	IRELAND	0.007	0.112***	0.104***	0.177***	−0.136***
		(0.021)	(0.029)	(0.018)	(0.014)	(0.035)
	LATVIA	0.057***	0.201***	−0.000	0.114***	−0.080**
		(0.020)	(0.022)	(0.025)	(0.018)	(0.036)
	LITHUANIA	0.251***	0.320***	0.196***	0.245***	0.079***
		(0.012)	(0.014)	(0.015)	(0.010)	(0.027)
	SLOVAKIA	0.141***	0.239***	0.214***	0.252***	−0.052
		(0.017)	(0.020)	(0.013)	(0.010)	(0.038)
	SPAIN	0.100***	0.233***	0.056**	0.147***	−0.072**
		(0.021)	(0.027)	(0.022)	(0.021)	(0.033)
Employment	*NOOCUP*	−0.019	−0.036	0.026	−0.048**	−0.008
		(0.018)	(0.026)	(0.020)	(0.019)	(0.023)
Age	*LESS35*	0.013	−0.002	0.026	0.033	0.006
		(0.021)	(0.030)	(0.024)	(0.021)	(0.025)
	50TO64	−0.022	0.004	−0.013	0.030	−0.009
		(0.023)	(0.033)	(0.025)	(0.024)	(0.029)
	65TO74	−0.013	−0.004	−0.031	0.038	0.031
		(0.031)	(0.046)	(0.034)	(0.034)	(0.047)
	MORE74	−0.024	0.045	−0.018	0.032	−0.049
		(0.035)	(0.049)	(0.037)	(0.046)	(0.091)
Education	*EBASIC*	−0.043**	−0.032	−0.045*	−0.018	0.003
		(0.021)	(0.032)	(0.023)	(0.024)	(0.029)
	ESECOND	−0.029	−0.032	−0.017	0.010	−0.013
		(0.019)	(0.027)	(0.021)	(0.020)	(0.023)

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Table 5 continued

	Variable	Electricity	Gas	Fixed tel.	Cellular t.	Internet
		Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.	Marg. eff.
Control variables	*ONEPERS*	−0.017	0.004	−0.024	−0.008	0.039
		(0.022)	(0.032)	(0.024)	(0.026)	(0.031)
	THREEPERS	−0.028	0.003	−0.000	0.035	0.068***
		(0.023)	(0.032)	0.025	(0.024)	(0.025)
	FOURPERS	−0.060**	−0.004	−0.002	0.005	0.041
		(0.025)	(0.035)	(0.026)	(0.025)	(0.027)
	MOREFOURP	−0.044	0.013	0.019	0.005	0.016
		(0.028)	(0.040)	(0.030)	(0.029)	(0.032)
	NOHOUSEPR	−0.100***	−0.061**	−0.069***	−0.066***	−0.015
		(0.019)	(0.028)	(0.023)	(0.021)	(0.025)
N		11,853	5,550	8,593	9,789	5,141
Wald chi^2		879.37	387.50	463.29	562.96	108.70
Prob > chi^2		0.000	0.000	0.000	0,000	0,000

Standard errors in parenthesis. Statistical significance at 1 % (***), 5 % (**), 10 % (*)
Source Computed by authors based on EC (2007)

Because no significant differences are found for this group of consumers as regards RP, we interpret that their lower satisfaction with the price of gas may be either an inconsistency or a sign that they are paying a higher unit cost than their peers, whilst restricting their consumption.

Age Wunder et al. (2013) observed that those over 65 had a tendency to report lower satisfaction with life in general. Interestingly, this observation only partially holds for our findings on satisfaction with specific utility services. Our estimations show that consumers between 65 and 74 and, particularly, those over 74, express *much lower* satisfaction with the price of the two new technologies, cellular telephony (−14.7 and −27 %, respectively) and the Internet (−24.9 and −31.5 %, respectively) than the reference group (consumers between 35 and 49). However, this observation about their lower satisfaction is *not* observed for the other three services. No significant effects are found for electricity, gas and fixed telephony. One way of interpreting this is that both cellular telephony and the Internet are "new" and perhaps daunting for the elderly. To the extent that the elderly are "new technology-avoiding" they may state price is the deterrent when in reality it is the new technology. As regards RP, consumers between 65 and 74, and the over 74s, spend *more* (respectively, +9 and +7.1 %) than the reference group on telecommunications services. We interpret this lower satisfaction, coupled with higher expenditure, as indicating that this group finds the changing telecommunications market complex, which leads them to take poorer consumption decisions, and paying a higher unit price, than the reference group. Moreover, findings on SP (Table 4) indicate that consumers between 65 and 74 and those over 74 are also less likely to subscribe to cellular telephony (−31.2 and −51.8 %, respectively) and Internet services (−29.4 and −35.9 %, respectively).

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Table 6 Estimates on households' expenditure on services

	Variable	Energy Coeff.	Telecomm. Coeff.
	Constant term	1.575***	−4.430***
		(0.094)	(0.126)
Country	*BELGIUM*	0.146***	−0.895***
		(0.023)	(0.031)
	DENMARK	−0.059***	−0.155***
		(0.019)	(0.026)
	ESTONIA	−1.359***	0.189***
		(0.042)	(0.057)
	FINLAND	−0.897***	0.064**
		(0.020)	(0.026)
	GREECE	−0.921***	0.522***
		(0.016)	(0.021)
	HUNGARY	0.152***	0.783***
		(0.021)	(0.029)
	IRELAND	−0.487***	0.160***
		(0.025)	(0.034)
	LATVIA	−1.266***	0.098**
		(0.035)	(0.047)
	LITHUANIA	−1.114***	0.032
		(0.030)	(0.040)
	SLOVAKIA	−0.508***	−0.219***
		(0.027)	(0.036)
	SPAIN	−0.427***	0.077***
		(0.011)	(0.015)
Employment	*ONEOCUP*	0.012	−0.049***
		(0.010)	(0.014)
	NONEOCUP	0.003	−0.203***
		(0.014)	(0.018)
Age	*RP LESS35*	−0.152***	0.101***
		(0.012)	(0.016)
	RP 50TO64	0.125***	0.109***
		(0.011)	(0.014)
	RP 65TO74	0.166***	0.090***
		(0.015)	(0.021)
	RP MORE74	0.178***	0.071***
		(0.016)	(0.022)
Education	*RP EBASIC*	0.029**	−0.175***
		(0.011)	(0.015)
	RP ESECOND	0.036***	−0.031**
		(0.011)	(0.015)

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Table 6 continued

	Variable	Energy Coeff.	Telecomm. Coeff.
Control variables	*NMEMBERS*	0.431***	0.604***
		(0.009)	(0.013)
	NMEMBERS2	−0.028***	−0.041***
		(0.001)	(0.002)
	NOHOUSEPR	−0.268***	−0.001
		(0.009)	(0.013)
	lnSPENDEQ	0.443***	1.003***
		(0.009)	(0.012)
N		71,124	71,124
F		1,216.69	1,266.59
Prob > F		0.000	0,000

Source computed by authors based on EUROSTAT (2011)

In contrast, they are more likely to be subscribers of fixed telephony (+17.1 and +18 %, respectively). We suggest that this consumer behavior demonstrates inertia may exist: this group exhibits comfort with traditional fixed telephony, but some reluctance to "upgrade" to new telecommunications products and offers such as "all-in-one" packages. By being more likely to subscribe to fixed than to cellular telephony, for instance, this category is more likely to use a fixed phone to call a cellular number, incurring a higher cost than a cellular-to-cellular call, or Internet communication. It is interesting that, for those consumers over 64 who do subscribe to cellular telephony and Internet services, the satisfaction "gap" is neutralized. As stated, age does not appear to influence price satisfaction in the case of energy services; we surmise therefore that the higher expenditure of those over 64 with respect to the reference group is due to greater consumption associated with their different lifestyles.

Other observations We found that consumers' socio-economic backgrounds are associated with satisfaction and expenditure patterns, but that these relationships are complex, and need to be interpreted on a case-by-case basis. There are four additional points of interest to mention related to the control variables before proceeding to our conclusions. Firstly, satisfaction with the price of all three telecommunications services is lower in those households with one member, though results for electricity and gas are not significant. This may suggest that economies of scale in service use and consumption are particularly important in telecommunications. Secondly, price satisfaction with all three telecommunications services and electricity is lower among those who do not own their home. Thirdly, income elasticity is much lower for energy than telecommunications services. Finally, the results for country dummies reflect the existing differences among EU countries as regards prices, as well as other cultural, contextual and other unobservable factors which may influence stated satisfaction (reflected in SP) and on the intensity of service use (and thus on expenditure decisions, reflected in RP).

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6 Conclusions

The aim of this paper has been to provide empirical evidence on the relationship between consumers' socio-economic background and satisfaction with a range of utility services. Our motivation stems from a recent increase in attention to consumer satisfaction, as seen, firstly, through the growth of satisfaction surveys around the world and, secondly, through the mounting concern expressed by international organizations and governments that differences in consumer satisfaction could be associated with socio-economic differences among consumer groups, which, in turn, might be ameliorated with carefully considered and targeted policy (OECD 2008; EP 2012; ECCG 2013). Empirical evidence could therefore be of use to those policy-makers interested in applying insights derived from Behavioral Economics to demand-side regulation with the aim of improving experiences of potentially vulnerable consumers.

We obtained our empirical evidence by analyzing the relationship between consumers' socio-economic background, expenditure decisions and satisfaction with energy (electricity and gas) and telecommunications (fixed telephony, cellular telephony and Internet) services across twelve European countries. To the best of our knowledge, this paper is the first research effort which contrasts SP and RP to examine consumer satisfaction with utility markets in multiple countries. We examined three major categories associated with potentially vulnerable consumers for which we had full and comparable data: the lesser educated, those not employed, and the elderly.

We highlight five main conclusions. Firstly, significantly lower satisfaction levels for all three categories were detected for some, but not all, of the utilities under study. In other words, the relationship between satisfaction and socio-economic group is uneven, and requires analysis on a case-by-case basis. Secondly, whilst some categories may be consistently associated with lower satisfaction for all services, others are not. So, we found that the less-educated exhibited lower satisfaction levels with the prices of all services than their peers, while the elderly and those not working expressed lower satisfaction with some, but not all, of the services considered. Thirdly, we detected sharper disparities among satisfaction with telecommunications markets than with energy markets in general. This could be because consumers find telecommunications markets more complex than energy markets, perhaps due to rapid technological change, and to the presence of greater competition (and consumer choice) in telecommunications than in energy in the EU context (Clifton et al. 2010). Furthermore, disparities in satisfaction between socio-economic groups were in general more intense in cellular and Internet technologies than in traditional fixed telephony, particularly for the elderly and consumers who were not employed. Fourthly, we found, by contrasting SP and RP, that different explanations for lower satisfaction could be extrapolated. For example, the lesser educated were less satisfied than their peers in both telecommunications and energy markets. However, they spent less than their peers in telecommunications and more on energy. So, the explanation for dissatisfaction differs: in telecommunications, this may reflect their reduced participation in these markets (confirmed by our analysis on the likelihood this group are subscribers), whilst in energy markets, this may be explained by their poor decision making. Fifthly, we found that, once consumers with socio-economic characteristics associated with vulnerability subscribed to particular services, their levels of satisfaction generally approximated that of their peers.

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In sum, our results pointed to the multidimensional and non-deterministic nature of vulnerability, which needs to be analyzed in a specific context.

These findings may be of interest to policy-makers who are considering introducing so-called "paternalistic" policies with a view to ameliorate differences in consumer satisfaction associated with specific socio-economic backgrounds. Our empirical evidence points to a heterogeneous consumer landscape where a "one-size-fits-all" approach is not warranted. For future discussions on the potential for demand-side policy and, in order to avoid over-regulation, it is important to analyze first, whether a correlation between socio-economic variables and satisfaction exists with a specific market and, if so, how significant any satisfaction difference is *vis-à-vis* peers. Moreover, contrasting SP and RP also helps shed light on *why* consumers may be dissatisfied. Reasons for dissatisfaction are important when deciding which kind of policies should be applied. Policy will differ if the aim is to promote consumers' take-up of a service, where issues of non-subscription are significant, or to improve the clarity of information about a service, where certain consumer groups are associated with poor market decisions.

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